Are Large Thermal Energy Storages a key element of the future energy system?

IEA-ES Task 39, Online Workshop

Dr. Jens Kuehne | December 5th 2023
» AGFW is an independent, impartial German association promoting energy efficiency, (district) heating, cooling and CHP – Combined Heat and Power – at national and international levels

» AGFW comprises more than 600 regional and municipal energy suppliers, consultants, experts manufacturing companies including component and system manufacturers, assembling companies and testing institutes within Germany and Europe

» AGFW represents approx. 95% of the heat load connected to German district heating systems – the largest scale in Western Europe

» AGFW with over five decades of expertise in the district heating sector covers the entire process chain of efficient district heating, district cooling and CHP
The Role and Significance of Heat Storages in DH Systems

Switch from CHP to RES Heat
→ Higher long term storage demand

Less balancing for electricity market, more balancing of availability of sources

Large is a relative definition
→ For small DH systems a tank storage can be large
» **DH in Germany mainly situated in large cities**
  • Different situation as in Denmark

» **Areas with high**
  • specific heat demand
  • property prices

» **Transport pipes might be an opportunity**
  • acceptable property prices, but
  • high costs for piping
  • difficult thermohydraulics
  • no feasible customers

**BUT!!!**
No need to copy Denmark’s small DH systems
- different circumstances (political, geologically, etc.)

Different but fitting concepts for Germany’s DH systems
- Aquifer storages in Berlin (planned, > 20 GWh, BTB)
- Aquifer storage in Hamburg (in construction, 5 GWh, Hamburger EnergieWerke)
- Borehole storages (37,500 m³, Stw. Crailsheim)

Aquifer storages
- low demand in terms of area
- High investment costs
- Need for specific geological circumstances

Borehole storages
- High demand in terms of area
- Construction under e.g. solarthermal collectors
darum fernwärme ...

denn sie ist stubenrein und hilft, CO₂ zu vermeiden.

Any more questions?

www.fernwaerme-info.eu
City Structure of Hamburg